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OFFICERS' PULSE



MARCH 2025 (In Depth)

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MONTHLY

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Foreword

Officers Pulse-In Depth provides detailed analyses of significant articles from a variety of sources including **The Hindu, Indian Express, Business Standard, Yojana, Kurukshetra, Down to Earth, and others.** These insights are extremely valuable for UPSC CSE Mains preparation. To ensure comprehensive preparation for both Prelims & Mains, we recommend studying **Officers Pulse-In depth** along with **Officers Pulse-Digest.**

Note: The keywords provided in the blue box below are crucial for Mains. They highlight essential themes and terminologies that can enhance the quality of answers.

Sample:

KEY WORDS

- **Monetary Policy Committee (MPC)** – Six-member RBI body deciding repo-rate to maintain inflation target ($4 \pm 2\%$).
- **Core Inflation** – Inflation rate excluding food and fuel, showing underlying price trends.
- **Headline Inflation** – Overall inflation measured by Consumer Price Index (CPI).
- **Tolerance Band** – Permissible inflation range around RBI's target for policy flexibility.
- **Section 45ZN, RBI Act 1934** – Mandates RBI to explain causes and remedies if inflation exceeds target for three quarters.
- **Fiscal-Monetary Coordination** – Synchronization of government spending and RBI policy for macro stability.
- **Financial Inclusion** – Ensuring affordable access to financial services for all sections, esp. vulnerable groups.

CONTENTS

CONTENTS.....	1
1) TRANSGENDER PERSONS AMENDMENT BILL 2026.....	2
2) IMPACT OF RISING SEA LEVELS (SLR) ON INDIAN COASTAL CITIES.....	5
3) ENTHUNASIA BILL	7
4) CENTRAL ARMED POLICE FORCE AMENDMENT BILL 2026	9
5) ELECTION COMMISSION OF INDIA (ECI)	11
7) JUDICIAL OVERREACH.....	16
8) RESEARCH AND DEVELOPMENT SECTOR IN INDIA.....	19
9) HEATWAVES	22
10) ENERGY DIVERSIFICATION	24

1) TRANSGENDER PERSONS AMENDMENT BILL 2026

(GS1- salient features of Indian society and diversity of India)

Background

- The Transgender Persons (Protection of Rights) Act, 2019 was enacted to protect transgender people from discrimination and social exclusion. It defined a transgender **person broadly as anyone whose gender does not match the gender assigned at birth** and included trans-men, trans-women, genderqueer individuals, and those with intersex variations.
- A landmark provision of the 2019 Act was the recognition of self-perceived gender identity, consistent with the **Supreme Court's NALSA judgment of 2014**, which had recognized the **right of transgender persons to self-identify their gender**. Under the 2019 Act, a person could obtain a Certificate of Identity from the District Magistrate based on self-declaration, without any mandatory medical examination.
- The government has now introduced the Transgender Persons Amendment Bill 2026 citing that the existing definition was "**vague and broad**", making it difficult to identify the genuinely oppressed persons for whom the Act was originally intended. The government also noted that the current definition was incompatible with several other statutory provisions.

Key Changes Proposed in the Transgender Persons (Protection of Rights) Amendment Bill, 2026

1) Revised Definition of 'Transgender Person'

- Persons with socio-cultural identities such as kinner, hijra, aravani, and jogta
- Eunuchs
- Persons with intersex variations such as congenital variations in primary sexual characteristics, external genitalia, chromosomal patterns, gonadal development, or endogenous hormone production
- Persons who have been forcibly compelled to assume a transgender identity through mutilation, castration, or surgical/chemical/hormonal procedures
- Crucially, the Bill explicitly excludes persons with different sexual orientations and self-perceived sexual identities from its ambit. It also removes the categories of trans-man, trans-woman, and genderqueer that were included in the 2019 Act.

2) Introduction of Medical Certification: It replaces the administrative process for identity cards with a Medical Board (headed by a Chief Medical Officer). This board's recommendation is now mandatory for the District Magistrate to consider before issuing a certificate of identity.

3) Name Change: It proposes that transgender persons can change their first names on birth certificates and ID documents. However, for this, individuals must meet the newly proposed statutory definition of a "transgender person".

4) Increased Oversight: Representatives on the National Council for Transgender Persons from States/UTs must now hold a minimum rank of Director in the relevant Ministry or Department, indicating a push for higher-level bureaucratic oversight.

5) New Criminal Category for Forced Identity: The Bill introduces a distinct category to address the "coerced" assumption of transgender identity. It penalizes the act of compelling a person (through force, deceit, or allurements) to undergo procedures like emasculation or hormonal changes to assume a transgender identity.

6) Increased Punishments: Kidnapping an adult to force a transgender identity can lead to minimum 10 years of rigorous imprisonment (RI), extendable to life. The same offence against a child mandates RI for life and a minimum fine of Rs 5 lakh.

Forcing an adult into begging or bonded labour as a transgender person invites 5-10 years RI. The same offence against a child attracts 10-14 years RI.

Key Concerns Raised by Civil Society and Activists

- **Undermining the NALSA Judgment:** The removal of self-perceived gender identity contradicts the Supreme Court's landmark 2014 ruling, raising questions about constitutional validity.
- **Treating Identity as a Medical Condition:** Subjecting transgender persons to examination by a medical board reinforces a pathologising approach to gender identity, which is contrary to global best practices and the principles of bodily autonomy and dignity.
- **Exclusion of Recognized Identities:** Removing trans-men, trans-women, and genderqueer individuals from the definition effectively strips a large section of the community of the legal protections previously afforded by the Act.
- **Lack of Consultation:** Highlighting concerns over inadequate consultation, transgender rights groups, civil society leaders, and community members have been protesting since the Bill's introduction, demanding its withdrawal or at least its referral to a Parliamentary Standing Committee for wider deliberation.

Positive Aspects Highlighted by Proponents

- **Stronger Penal Safeguards:** The graded penalty system for offences such as abduction, forced bodily harm, and exploitation through begging/servitude provides much-needed legal teeth to the Act.
- **Protection of Bodily Integrity:** By specifically penalising forced identity changes and irreversible bodily harm, the Bill reinforces constitutional guarantees against forced labour and trafficking.
- **Targeted Welfare Delivery:** A more precise definition could, in principle, help ensure welfare benefits reach the most marginalised sections of the transgender community who face extreme social exclusion.

Way forward

- **Community Consultation:** The government should hold nationwide town halls with diverse trans groups to ensure the law reflects lived experiences.
- **Adherence to NALSA:** Re-incorporate the right to self-identification to ensure the Bill stands the test of constitutional validity in the Supreme Court.
- **Sensitization of Medical Boards:** If boards are kept, they must include transgender representatives and psychologists rather than just surgeons.
- **Horizontal Reservation:** Instead of just redefining identity, focus on providing horizontal reservations in jobs and education as suggested by various High Courts.
- **Decentralized ID Process:** Simplify the certification process to a self-declared affidavit to minimize bureaucratic corruption and harassment.

KEY WORDS

- **Supreme Court's NALSA judgment of 2014** which had recognized the **right of transgender persons to self-identify their gender**.

UPSC PYQ

- Starting from G.B. Pant's speech in the Constituent Assembly, explain the evolution of the concept of 'Individual Liberty' in the Indian Constitution (2014)
- Examine the scope of Fundamental Rights in the light of the latest judgement of the Supreme Court on Right to Privacy." (2017)
- Constitutional Morality' is rooted in the Constitution itself and is founded on its essential facets. Explain the doctrine of 'Constitutional Morality' with the help of relevant judicial decisions. (2021)

2) IMPACT OF RISING SEA LEVELS (SLR) ON INDIAN COASTAL CITIES

(GS-I: Geography; GS-III: Environment & Disaster Management)

Background

As of **April 2026**, the Indian Ocean continues to warm faster than any other ocean basin. The **IPCC AR6** and recent **Ministry of Earth Sciences (MoES) reports** confirm that sea levels in the North Indian Ocean are rising at **4.3–4.6 mm/year**. This phenomenon has transitioned from a slow-onset threat to an immediate catalyst for "Compound Events"—where sea-level rise, storm surges, and high tides paralyze urban infrastructure.

Impacts of Rising Sea Levels

- 1. Inundation of Megacities:** Low-lying wards in Mumbai, Kolkata, and Chennai face chronic flooding and partial submergence.
Eg: The 2025 Blue Sky Flooding in Mumbai saw Marine Drive inundated during fair weather as sea levels bypassed traditional drainage.
- 2. Economic Drain on Infrastructure:** Trillions of dollars in coastal assets, including ports and sea links, require "climate-proofing."
Eg: The 2025 TERI Report highlighted a 10–15% drop in property prices in south Mumbai's low-lying wards due to high-risk flood disclosures.
- 3. Saltwater Intrusion:** Saline ingress into freshwater aquifers has contaminated drinking water in over 150 coastal blocks.
Eg: The 2026 Kaveri Delta Salinity Crisis saw seawater seepage 15 km inland, causing total crop failure in parts of Tamil Nadu's "Rice Bowl."
- 4. Climate-Induced Displacement:** The loss of habitable land is creating a new class of "Internal Climate Refugees."
Eg: The 2026 Sathabhaya Relocation in Odisha marked the successful movement of residents from seven submerged villages under India's first formal resettlement protocol.
- 5. Loss of Bio-Shields:** Submergence of mangroves (Sundarbans) removes the first line of defense against storm surges and cyclones.
- 6. Blue Economy Disruption:** Fisheries and salt pan industries livelihoods for millions are being wiped out as the shoreline shifts.

Challenges

- 1. Veto of Nature (Infrastructure Failure):** "Hard" solutions like sea walls often accelerate erosion in adjacent "unprotected" areas.
- 2. Weak Coastal Regulation Zone CRZ Compliance:** High-density construction continues near the **High Tide Line (HTL)** despite increasing vulnerability.
- 3. Data & Mapping Gaps:** Lack of hyper-local, high-resolution **Bathymetric data** makes street-level flood prediction difficult for municipal bodies.
- 4. Legal Vacuum for Refugees:** India lacks a dedicated national legal framework to define and support the integration of climate migrants.
Eg: Protests in Odisha in early 2026 highlighted the lack of land titles and livelihood security for families displaced by sea-level rise.
- 5. Funding Constraints:** Transitioning to "Sponge City" infrastructure requires massive capital that most Urban Local Bodies (ULBs) lack.

6. **Compound Disasters:** Difficulty in managing scenarios where high tides prevent the drainage of heavy monsoon rain, leading to prolonged urban "water-logging."

Way forward

1. **Nature-Based Solutions (Nbs):** Scale the **MISHTI (2023–2028)** scheme to create thick "Green Belts" of mangroves to act as natural shock absorbers.
2. **Sponge City Infrastructure:** Adopt permeable surfaces and restored urban wetlands (as seen in the **Chennai 2026 Water Plan**) to soak up surges.
3. **Managed Retreat Policy:** Establish a formal **National Managed Retreat Framework** for dignified relocation from "Red Zones," using the **Sathabhaya Model** as a blueprint.
4. **Ensure Strict Accountability:** Safety failures should have real consequences. **The "Polluter Pays Principle" should hold mine owners, contractors, and negligent officials financially and legally responsible for accidents.**
5. **Integrated Coastal Zone Management (ICZM):** Shift from reactive relief to long-term strategies that balance port development with ecological limits.
6. **Climate-Smart Insurance:** Develop "Coastal Catastrophe Bonds" to buffer small businesses and fishers against asset loss.

Eg: The 2026 Blue Economy Risk Framework proposed insurance pools for salt-pan workers to offset income loss from tidal flooding.

Conclusion

The encroaching Indian Ocean is redrawing India's borders without a war. To achieve **Viksit Bharat @ 2047**, coastal resilience must be treated as a pillar of **National Security**, ensuring that our socio-economic progress is not reclaimed by the sea.

UPSC PYQ

- *Discuss the vulnerability of India to climate change. [2020]*

KEY WORDS

- **High Tide Line (HTL)** :The maximum landward limit reached by sea water during the highest high tide, used for coastal regulation.
- **Green Belts (Coastal)** :Dense stretches of vegetation (like mangroves) along coasts that act as natural buffers against erosion, storm surges, and flooding.
- **Integrated Coastal Zone Management (ICZM)** : A holistic approach that balances coastal development with environmental conservation through coordinated planning and regulation.
- **Coastal Catastrophe Bonds:** Financial instruments that transfer disaster risk from governments/communities to investors, providing funds after coastal disasters.

3) ENTHUNASIA BILL

(GS Paper II: Fundamental Rights, Role of Judiciary and Governance & policy-making in health sector)

Introduction

Euthanasia, commonly known as “mercy killing,” refers to the deliberate act of ending a person’s life to relieve intractable suffering caused by terminal illness or irreversible medical conditions. The issue lies at the intersection of **fundamental rights, medical ethics, and societal values**, raising questions about whether the **right to life includes the right to die with dignity**.

Background

India does not yet have a comprehensive statutory framework on euthanasia; instead, the legal position has evolved through judicial pronouncements:

- In the **Aruna Shanbaug Case**, the **Supreme Court of India** allowed **passive euthanasia** under strict safeguards and judicial oversight.
- In **Common Cause v. Union of India**, the Court recognized “**Right to Die with Dignity**” as part of **Article 21**.
- The Court also legalized **Living Wills (Advance Directives)**.
- The **Harish Rana Case** highlighted procedural bottlenecks in implementing living wills, strengthening the case for legislation.

Thus, India currently follows a **judge-made framework**, necessitating a clear and comprehensive **Euthanasia Bill**.

Ethical Perspectives of Euthanasia

1. Autonomy (Right to Self-Determination)

- Individuals have the right to make informed decisions about their own life and death.
- Respects personal dignity and freedom of choice.
- Supports **passive euthanasia**, where patients can refuse life-sustaining treatment.

2. Beneficence (Acting in Patient’s Best Interest)

- Medical care should aim to reduce pain and suffering.
- Withdrawal of futile treatment is considered compassionate.
- Passive euthanasia aligns with relieving prolonged suffering of terminally ill patients.

3. Justice (Fairness and Equity)

- Ensures equal access to palliative care and end-of-life options.
- Protects vulnerable groups from coercion or misuse.
- Decisions must not be influenced by poverty, social pressure, or lack of care facilities.

Need to Reform Passive Euthanasia in India

1. Procedural Delays

- Despite 2018 guidelines, multi-layered approvals delay decisions.
- Leads to prolonged suffering and undermines dignity in death.

2. Practical Inaccessibility

- Complex legal procedures discourage compliance.
- Families and doctors often take informal decisions, risking legal consequences.

3. Low Awareness

- Limited knowledge about **living wills** and **advance directives**.

- Reduces effective utilization of legal provisions.

4. Socio-Cultural Resistance

- Ethical and religious beliefs emphasize sanctity of life.
- Euthanasia is often perceived as morally unacceptable.

5. Fragmented Healthcare System

- Unequal healthcare infrastructure across regions.
- Lack of trained personnel and ethics committees delays decisions.

Reforms Required for Passive Euthanasia in India

1. Digitisation of Advance Directives

- Create a **national registry/portal** for living wills.
- Enable easy registration, modification, and revocation.
- Allow online verification of patient consent and mental capacity.

2. Hospital-Level Ethics Committees

- Establish committees with doctors, palliative care experts, and independent members.
- Authorize withdrawal of treatment within a fixed timeframe (e.g., 48 hours).
- Reduce dependence on higher bureaucratic approvals.

3. Transparent Oversight Mechanism

- Use digital dashboards or state-level monitoring authorities.
- Conduct audits and publish reports to prevent misuse and ensure accountability.

4. Mandatory Safeguards

- Introduce cooling-off period before final decision.
- Ensure psychological counselling and palliative care consultation.
- Protect vulnerable individuals from coercion or undue influence.

5. Capacity Building & Awareness

- Include end-of-life ethics in medical education.
- Conduct awareness campaigns on living wills and palliative care.
- Promote informed decision-making among patients and families.

6. Simplification of Procedures

- Streamline approval processes while retaining safeguards.
- Ensure timely and humane decisions for terminally ill patients.

Conclusion

Euthanasia is a sensitive issue that balances personal choice, medical ethics, and social values. In India, courts have recognized the right to die with dignity, but the absence of a clear law creates confusion, delays, and unequal access. There is a need to reform passive euthanasia so that terminally ill patients do not suffer due to complex procedures or lack of awareness, while also ensuring safeguards to prevent misuse. A clear legal framework, along with proper systems and awareness, can help ensure that end-of-life decisions are made in a fair, transparent, and dignified manner.

KEY WORDS

- **Autonomy**- Right of a patient to make informed decisions about their own life and death.
- **Dignity in Death**- Ensuring a person dies without unnecessary suffering or loss of dignity.
- **Safeguards**- Legal measures to prevent misuse and protect vulnerable individuals.

4) CENTRAL ARMED POLICE FORCE AMENDMENT BILL 2026

(GS1- Indian Constitution—Historical Underpinnings, Evolution, Features, Amendments, Significant Provisions and Basic Structure.

GS2- Security Challenges and their Management in Border Areas - Linkages of Organized Crime with Terrorism and Various Security Forces and Agencies and their Mandate.)

Background

This Bill addresses the long-standing friction between the **Indian Police Service (IPS)** and the **Group 'A' General Duty Officers (GAGDOs)** of the Central Armed Police Forces. By institutionalizing IPS leadership, the government seeks to solidify the "unifying link" of the federal structure, though it faces significant pushback regarding career stagnation and judicial override.

Key Features of the Bill:

- **Scope of Application:** Applies to five primary CAPFs: **CRPF, BSF, CISF, ITBP, and SSB**. The government can add more forces via notification.
- **Rule-Making Power:** Empowers the Central Government to frame rules for recruitment, deputation, and service conditions, overriding any existing laws or court orders.
- **Mandatory IPS Deputation:** Explicitly earmarks high-level posts for IPS officers:
 - **50%** of Inspector General (IG) posts.
 - **Minimum 67%** of Additional Director General (ADG) posts.
 - **100%** of Special Director General (SDG) and Director General (DG) posts.
- **Protection of Benefits:** Saves and continues all existing financial benefits granted to Group 'A' officers prior to the Act.
- **Personnel Coverage:** Includes Group 'A' executive officers (Assistant Commandant and above), IPS officers on deputation, and Army officers on deputation or re-employment.

Need for Such Changes:

- **Inter-Agency Coordination:** IPS officers provide a bridge between the Union's armed forces and State police departments. **Example:** Since IPS officers (ADGs/SDGs) hold senior operational posts in States, having them in CAPF leadership ensures seamless coordination during internal security crises.
- **Maintaining Force Character:** The Bill institutionalizes the unique character of CAPFs as forces that assist civil power. **Example:** The Supreme Court noted in *Sanjay Prakash (2025)* that IPS presence is vital to maintain the functional ethos and administrative requirements of these forces.
- **National Integration:** Reflects Sardar Patel's vision of the IPS as a unifying link across the federal structure. **Example:** IPS officers bring field experience from various States, giving them a broader strategic vision required to lead national border and industrial security forces.
- **Legislative Supremacy:** Clarifies that service policy falls under the domain of the Executive and Legislature, not the Judiciary. **Example:** The Bill rectifies the judicial overreach where courts previously directed a reduction in IPS deputation quotas, which is essentially a policy matter.
- **Camaraderie and Training:** Mandatory stints at the Centre for IPS officers foster better relationships with cadre officers. **Example:** As per the January 2026 MHA guidelines, mandatory two-year central stints for IPS IGs will help cement operational bonds with CAPF-cadre subordinates.

Challenges Associated:

- **Stagnation of Cadre Officers:** High-level IPS quotas limit the career progression of GAGDOs (Group A General Duty Officers). **Example:** Direct-entry CAPF officers often wait decades for promotions, as the top tiers (ADG, SDG, DG) are now legally reserved for IPS officers.
- **Judicial Conflict:** The Bill appears to directly undo recent Supreme Court directions. **Example:** It overrides the *Sanjay Prakash (2025)* ruling which instructed the government to progressively reduce IPS deputation at the IG level within two years.
- **Parachuting Perception:** There is perceived resentment among cadre officers who feel IPS officers lack specific force-specific expertise. **Example:** Critics argue that an officer who has spent a career in district policing may not be immediately suited for specialized roles like border guarding (BSF) or industrial security (CISF).
- **Federal Friction:** While intended as a link, the dominance of IPS can sometimes lead to friction between Central command and State requirements. **Example:** Dependence on a single service for top leadership can lead to service-specific biases in resource allocation and operational strategy.
- **Legal Challenges:** The notwithstanding clause may be challenged on the grounds of constitutional validity. **Example:** Opponents may argue that overriding court orders regarding Organised Group A Service (OGAS) status violates the principle of judicial review.

Way Forward

- **Timely Cadre Reviews:** To mitigate resentment, the government must conduct regular cadre reviews to increase the total number of posts, ensuring growth for both IPS and cadre officers.
- **Balanced Deputation:** While maintaining IPS at the top, the government could explore increasing the share of cadre officers in specialized technical or training wings.
- **Specialized Induction:** IPS officers being deputed to CAPFs should undergo mandatory force-induction training to understand the specific operational nuances of the BSF, CRPF, etc.
- **Strengthening OGAS Rights:** Ensuring that the financial and administrative benefits of being an Organised Group A Service are fully realized by CAPF cadre officers.

KEY WORDS

- *CRPF, BSF, CISF, ITBP, and SSB – central Para Military forces under Ministry of Home Affairs*
- *Sanjay Prakash (2025) ruling which instructed the government to progressively reduce IPS deputation*

5) ELECTION COMMISSION OF INDIA (ECI)

(GS Paper II (Polity- Appointment to various Constitutional posts, powers, functions and responsibilities of various Constitutional Bodies).

Introduction

The Election Commission of India (ECI) is an autonomous constitutional authority responsible for administering free and fair elections across the country. Established on 25 January 1950 in accordance with the Constitution of India, it derives its powers from Article 324, which grants it the superintendence, direction, and control over the entire electoral process for the Lok Sabha, Rajya Sabha, State Legislative Assemblies, and the offices of the President and Vice President. The ECI functions as a permanent body headed by the Chief Election Commissioner along with two other Election Commissioners, ensuring its independence from executive interference.

Concerns regarding Independence of ECI

1. Issues in Appointment Process

- The **Constitution of India** originally did not lay down a clear procedure, leaving appointments largely to the Executive.
- In **Anoop Baranwal v. Union of India (2023)**, the Supreme Court introduced a collegium (PM, LoP, CJI) to ensure neutrality.
- The **Chief Election Commissioner and Other Election Commissioners Act, 2023** replaced the CJI with a Union Minister, giving the Executive a **2:1 majority**, raising concerns over institutional bias.

2. Flaws in Removal Mechanism

- The Chief Election Commissioner enjoys protection similar to a judge of the **Supreme Court of India**, ensuring high security of tenure.
- However, Election Commissioners can be removed by the President on the recommendation of the CEC.
- This unequal protection creates a **hierarchical structure**, potentially pressuring ECs to align with the Executive or CEC.

3. Concerns over Financial Autonomy

- Unlike bodies such as the **Comptroller and Auditor General of India**, ECI's expenditure is not charged on the Consolidated Fund of India.
- Its budget is subject to parliamentary approval as **voted expenditure**.
- This arrangement may indirectly expose the Commission to **financial dependence on the government of the day**.

4. Weak Enforcement Powers (MCC & Institutional Limits)

- The **Model Code of Conduct (MCC)** is not legally binding, limiting enforceability.
- This leads to perceptions that the ECI is **selective or ineffective**, especially in cases involving powerful political actors.
- Lack of punitive powers reduces its ability to act as a strong deterrent against violations.

5. Electoral Integrity, Transparency & Technology Issues

- Electoral roll revisions like SIR have triggered allegations of **mass voter deletions** and selective disenfranchisement.
- Wide discretion of Booth Level Officers with limited oversight may lead to **arbitrary exclusion of voters**.
- Concerns over **45-day data deletion**, along with challenges from **AI-generated misinformation and deepfakes**, raise issues of transparency and public trust.

Constitutional Safeguards Ensuring Independence of the ECI

1. Vesting of Electoral Authority (Article 324(1))

- The **Constitution of India** vests complete control over elections in the ECI.
- It includes preparation of electoral rolls and conduct of elections to Parliament, State Legislatures, and President/Vice-President.
- Ensures **centralised authority and functional autonomy**.

2. Composition and Appointment (Article 324(2))

- ECI consists of the CEC and other Election Commissioners as determined by the President.
- Appointment by the President provides **constitutional legitimacy**.
- Allows Parliament to regulate conditions through law.

3. Collegial Structure with CEC as Chairman (Article 324(3))

- The CEC acts as the Chairman when multiple commissioners are appointed.
- Promotes **collective decision-making** rather than individual dominance.
- Ensures administrative coordination and stability.

4. Operational Support through Regional Commissioners (Article 324(4))

- President can appoint Regional Commissioners in consultation with the ECI.
- Strengthens administrative capacity during elections.
- Enhances efficiency without compromising independence.

5. Security of Tenure and Administrative Support (Article 324(5) & (6))

- CEC removal is similar to a **Supreme Court of India judge**, ensuring strong protection.
- Service conditions cannot be altered to the disadvantage of members.
- President/Governor must provide necessary staff → ensures **functional independence**.

Key Judgments Regarding ECI Independence

- **Indira Nehru Gandhi v. Raj Narain (1975)**: Established that free and fair elections are part of the **Basic Structure** of the Constitution of India, reinforcing the constitutional importance of the ECI.
- **Mohinder Singh Gill v. CEC (1978)**: Affirmed that the ECI has **plenary powers under Article 324** to ensure free and fair elections where laws are silent.
- **A.C. Jose v. Sivan Pillai (1984)**: Clarified that the ECI cannot override existing statutory provisions, ensuring its powers function within the rule of law.
- **T.N. Seshan v. Union of India (1995)**: Upheld the multi-member structure and emphasized that the CEC is only “first among equals,” ensuring collective functioning. **Anoop Baranwal v. Union of India (2023)** and **Vineet Narain v. Union of India (1997)**: Strengthened institutional independence by addressing appointment procedures and protecting the tenure of Election Commissioners.

Key committee recommendations for independence of the ECI

- **Dinesh Goswami Committee (1990)**: Recommended setting up a **formal selection committee** for appointing Election Commissioners and giving **legal status to the Model Code of Conduct** to avoid selective enforcement.
- **Indrajit Gupta Committee (1998)**: Suggested **State funding of elections** to reduce the influence of money in the electoral process.
- **Second Administrative Reforms Commission (2005)**: Proposed a **collegium system** including the Prime Minister, Speaker, Leader of Opposition, Law Minister, and Deputy Chairman of Rajya Sabha for appointments.

- **Law Commission of India (255th Report, 2015):** Recommended **equal protection in removal** for all Election Commissioners to ensure independence.
- **Law Commission (2015):** Also suggested creating a **permanent and independent secretariat** for the ECI to strengthen its administrative autonomy.

Way Forward

1. **Equal Security of Tenure:** All Election Commissioners should get the same protection as the Chief Election Commissioner. Right now, only the CEC has strong removal protection like a judge of the Supreme Court of India. Giving equal protection to all will reduce pressure from the government and ensure fairness.
2. **Reform in Appointment Process:** The appointment system under the **Chief Election Commissioner and Other Election Commissioners Act, 2023** should be improved. A fair system with more members (including judiciary or consensus) will reduce government control and increase trust.
3. **Financial and Administrative Autonomy:** The Election Commission of India should have more financial freedom. Its expenses should come directly from the Consolidated Fund of India. Also, an independent office (secretariat) will help it work freely.
4. **Post-Retirement Restrictions:** There should be a cooling-off period or ban on government jobs after retirement. This will prevent bias and ensure that commissioners take decisions without expecting future benefits.
5. **Transparency and Technology:** Election processes should be more transparent. Voter lists should be checked properly, complaints handled well, and election data kept longer. Better checking of EVM-VVPAT and control of fake news will increase public trust.

Conclusion

The independence of the Election Commission of India is essential for conducting free and fair elections, which are the foundation of democracy in India. Although the Constitution of India provides safeguards under Article 324, growing concerns about appointments, finances, and transparency highlight the need for reforms. Strengthening these areas will ensure greater neutrality and public trust. In the long run, an independent and strong ECI is vital to protect electoral integrity and uphold democratic values.

KEY WORDS

- **Autonomy-** Right of a patient to make informed decisions about their own life and death.
- **Dignity in Death-** Ensuring a person dies without unnecessary suffering or loss of dignity.
- **Safeguards-** Legal measures to prevent misuse and protect vulnerable individuals.

UPSC PYQ

Discuss the role of the Election Commission of India in the light of the evolution of the Model Code of Conduct. [2022]

6) THE LEGALITY OF INTERSTATE STRIKES UNDER THE UN CHARTER

(GS-II International Relations)

Background

The coordinated strikes by the U.S. and Israel on Iran have raised serious concerns about violations of international law, especially International Humanitarian Law (IHL). Bodies like UNESCO have condemned the attacks as grave breaches of the "laws of war," which aim to reduce human suffering during armed conflict. The issue highlights the tension between military objectives and humanitarian obligations.

Constitutional and Policy Framework of the UN Charter

1. **Article 2(4) (The General Prohibition):** This is the "cornerstone" of the Charter. It mandates that all Member States refrain from the **threat or use of force** against the territorial integrity or political independence of any state.
2. **Article 51 (The Right to Self-Defense):** This provides the *only* unilateral exception to Article 2(4). It allows for force **only if an armed attack occurs**.
Customary Requirement: Under the *Caroline Test*, self-defense must be necessary (no other choice) and proportionate (not excessive).
3. **Chapter VII (Security Council Authority):** Articles 39–42 empower the **UN Security Council (UNSC)** to authorize collective military action to maintain or restore international peace. Without a UNSC resolution, offensive strikes are generally considered "acts of aggression."
4. **International Humanitarian Law (IHL):** Governing *how* war is fought (*jus in bello*), IHL principles like **distinction** (targeting only military objectives) and **precaution** are binding even if the initial use of force was illegal.

Global Conflicts Challenging the Charter

Modern global crises are testing the limits of the UN legality framework through various "Legal Challenges"

1. **The Myth of "Anticipatory" Self-Defense: Pressures** Article 2(4) & 51. States hit "potential" threats (like nuclear sites) before an attack happens. Law usually rejects this unless the threat is truly "imminent." (*e.g., Iran Strikes 2026*).
2. **Targeted Assassinations & Sovereign Equality: Undermines** Article 2(1). Killing state leaders (like Iran's Supreme Leader) violates the principle that all heads of state have legal protection. (*e.g., Iran Strikes 2026*).
3. **Veto Deadlock & Expansionism: Paralyzes** the Security Council. Powerful nations use their **Veto Power** to stop the UN from punishing their own land-grabs or actions. (*e.g., Russia-Ukraine War*).
4. **Domestic Jurisdiction vs. Human Rights: Challenges** the scope of Article 2(7). It asks if the UN can enter a "civil" war to stop mass suffering under the **Responsibility to Protect (R2P)**. (*e.g., Sudan Civil War*).
5. **Collateral Damage & War Crimes:** Contravenes the Rome Statute. Strikes near schools or hospitals (*e.g., Minab primary school*) are violate the IHL principle of proportionality. They become war crimes if civilian harm outweighs the military gain. (*e.g., Ethiopia-Eritrea / Iran*).
6. **Retaliatory Cycles:** Exploits the "Self-Defense" clause. When one state strikes and the other hits back at regional bases (*e.g., Qatar/Bahrain*), both claim legal cover, creating an endless cycle of unchecked violence.

Way Forward: Restoring the Rules-Based Order

1. **Enforcing Judicial Accountability:** Strengthening the role of the **International Court of Justice (ICJ)** to issue advisory opinions on the legality of specific strikes, ensuring that "national interest" does not override "international obligation."
2. **Defining "Imminence" in the Digital/Nuclear Age:** The UN must update the legal definition of an "armed attack" to include whether cyber-warfare or rapid nuclear weaponization meets the threshold of Article 51, preventing states from using ambiguity as a shield for aggression.
3. **Multilateralism over Unilateralism:** Shifting the global security architecture back to the UNSC. Even when the Council is deadlocked by vetoes, the **"Uniting for Peace" resolution** (GA Res 377A) can be used by the General Assembly to recommend collective measures
4. **Universal Application of IHL:** Moving toward a "Digital Accessibility" for war data where real-time satellite and AI monitoring of strikes ensures that violations in remote areas are immediately documented for future prosecution.

Conclusion

The UN Charter is not a menu for selective compliance. To prevent a slide into global anarchy, the international community must treat the rules-based order as a **collective asset** rather than a strategic burden. For a **Viksit Bharat @ 2047**, the legal sanctity of borders and the protection of human lives must remain absolute, ensuring that **power never replaces principle** in the conduct of international relations.

KEY WORDS

- **International Humanitarian Law (IHL)** : A set of rules that regulates the conduct of war by protecting civilians and restricting means and methods of warfare.
- **Caroline Test** : A customary rule stating that self-defense is lawful only when it is necessary (imminent threat) and proportionate (limited response).

7) JUDICIAL OVERREACH

(GS-II Structure, Organization and Functioning of the Executive and the Judiciary)

Background

Judicial review is an important power of the judiciary, but **when used beyond limits**, it can lead to **judicial overreach**. The recent 2026 incident, where the Supreme Court banned an NCERT Class 8 chapter on "Judicial Corruption" and blacklisted its authors, has brought this issue into focus. By stepping into matters like school curriculum which is usually handled by the executive and experts; **the Court raised concerns about crossing its boundaries and disturbing the balance between different branches of government.**

Judicial overreach

- Judicial overreach happens when **courts go beyond their limits** and interfere in the work of the legislature or executive.
- It is when **judges start making policy decisions** instead of just protecting rights.
- Unlike judicial activism, which fills gaps in law, overreach disrupts the balance of power.
- It is **subjective**; what courts see as justice, others may see as interference.

Evolution

- The term "**Judicial Overreach**" is **not written in the Constitution**.
- Its development is linked to **Article 142**, which gives the Supreme Court wide powers to do "**complete justice**" in any case.
- In the **1980s**, with the **rise of Public Interest Litigation (PIL)**, courts began taking up issues like environment and social justice.
- In the **1990s**, due to a **weaker and divided executive**, the **judiciary became more active** and started expanding its role.
- The **Kesavananda Bharati case** strengthened this trend by making the **judiciary the final authority to interpret and protect the Constitution**.

Challenges in Judicial over-reach

1. **Violation of Separation of Powers:** It undermines the "check and balance" system by encroaching upon the domains of the Executive and Legislature, potentially leading to a "Judicial Tyranny."
Example: The 2016 order making the **National Anthem mandatory in cinemas** was seen as the Court performing the role of a moral and administrative legislator.
2. **Lack of Expertise in Technical Matters:** Judges are experts in law, not in economics, environment, or science, leading to orders that may be practically or technically unfeasible.



Judicial Review:

It is the power of courts to examine the constitutionality of laws and executive actions and strike them down if they violate the Constitution.

While the term "Judicial Review" is not explicitly mentioned in the Constitution, the power is derived from several articles:

- **Article 13:** Declares that any law which contravenes Fundamental Rights shall be void.
- **Articles 32 and 226:** Empower the Supreme Court and High Courts, respectively, to issue writs for the enforcement of rights.
- **Article 142:** Allows the Supreme Court to pass any order necessary for doing "complete justice" in any cause or matter. This is often the primary tool for Judicial Activism.



Judicial review has been declared a "basic feature" of the constitution by the Supreme court in *Minerva Mills v. Union of India* case.



Judicial activism:

- It refers to the proactive role of the judiciary in expanding and interpreting constitutional provisions to protect Fundamental Rights and deliver justice.
- It includes the use of tools like Public Interest Litigation (PIL) to promote social justice and address issues such as gender equality and human rights.
- Judicial activism is not explicitly mentioned in the Constitution but is derived from Articles 32 and 226. It is also guided by Directive Principles to promote social and economic justice.

Example: The **ban on all diesel vehicles over 10 years old** in Delhi-NCR ignored the economic impact on transport and the technical nuances of engine maintenance.

3. **Governance and Administrative Vacuum:** Constant interference makes the Executive hesitant to take bold policy decisions, as they fear any move might be stayed or overturned by the Court.

Example: Frequent stays on **infrastructure projects (like the Char Dham road expansion)** based on interim environmental petitions can lead to massive cost overruns and delays.

4. **Increasing Judicial Backlog:** By taking up Public Interest Litigations (PILs) on trivial or administrative issues, the Court diverts its limited time away from thousands of pending constitutional and criminal cases.

Example: Courts spending time on issues like **regulating the height of human pyramids** in festivals while millions of undertrials wait for their day in court.

5. **Erosion of Public Trust and Accountability:** Unlike the Legislature, the Judiciary is not elected or accountable to the public; frequent overreach in popular policy matters can make the Court appear politically biased.

Example: The **NJAC judgment**, where the Court struck down a unanimous parliamentary law for judicial appointments, led to a prolonged public standoff between the Judiciary and the Government.

Ways Forward: Balancing Activism and Restraint

1. **Adherence to Judicial Restraint:** Courts should adopt a "self-limiting" approach, ensuring that activism remains a tool for protecting rights (Activism) rather than a means to govern the nation (Overreach).
2. **Strict Filtering of PILs:** The Judiciary must implement rigorous "admission criteria" for Public Interest Litigations to prevent the court from becoming a forum for solving trivial administrative or political grievances.
3. **Respecting Functional Specialization:** In cases involving complex economic, technical, or scientific issues, the Courts should rely on expert committees rather than issuing sweeping mandates.
4. **Strengthening Executive Accountability:** The Legislature and Executive must perform their duties proactively to eliminate the "governance vacuum" that often forces the Judiciary to step in.
5. **Standardizing Article 142 Guidelines:** While the power to do "complete justice" is vital, the Supreme Court should establish clear, self-imposed guidelines for its use to avoid arbitrary or unpredictable rulings.

Conclusion

Judicial review is essential for protecting the Constitution, but its misuse can disturb the balance of power among institutions. While judicial activism has played a positive role in safeguarding rights, unchecked intervention risks turning into overreach. The judiciary must exercise restraint and respect institutional boundaries to maintain democratic equilibrium. Ultimately, a harmonious balance between all three organs is key to effective and accountable governance.

KEY WORDS

- **Judicial Review**- Power of courts to examine laws and executive actions to ensure they comply with the Constitution.
- **Judicial Overreach**- Excessive judicial intervention in legislative or executive domains beyond constitutional limits.
- **Judicial Activism**- Proactive role of judiciary in protecting rights and filling legal or governance gaps.
- **Separation of Powers**- Constitutional principle dividing authority among legislature, executive, and judiciary to prevent concentration of power.
- **Checks and Balances**- System where each organ of government limits the powers of the others to maintain balance.

8) RESEARCH AND DEVELOPMENT SECTOR IN INDIA

(GS-III “Science & Technology Developments and their applications and effects in everyday life, Indigenization of technology and developing new technology, Investment models (public vs private participation in R&D)”

Introduction

India's R&D expenditure stands at about 0.64% of GDP, with the public sector contributing around 60% and the private sector about 35–36%, indicating an evolving research architecture with growing participation across sectors. India has emerged as a significant knowledge economy, being the **second-largest producer of STEM (Science, Technology, Engineering, and Mathematics) graduates globally**, providing a strong human capital base for innovation. This is complemented by its position at **38th in the Global Innovation Index (2025)**, reflecting steady progress in building an innovation-driven ecosystem.

Significance of R&D Across Key Sectors

- 1. Pharmaceuticals & Biotechnology:** R&D in this sector significantly strengthens India's healthcare security and global pharmaceutical leadership, being one of the largest contributors to industrial R&D, driven by a strong generic drug industry and focus on vaccine development (e.g., Covaxin), **biopharmaceuticals, genomics, and biosimilars, supported by the Biotechnology Industry Research Assistance Council (BIRAC)**, which funds startups and translational research.
- 2. Defence & Space Technologies:** R&D forms the backbone of national security and strategic autonomy, constituting a major share of public sector scientific expenditure led by Defence Research and Development Organisation (DRDO) and Indian Space Research Organisation (ISRO), focusing on missile systems, indigenous fighter jets, satellite technology, launch vehicles, and space exploration missions.
- 3. Information Technology & Emerging Technologies:** R&D drives India's digital economy and global competitiveness, powered by Global Capability Centres (GCCs) in hubs like Bengaluru and Hyderabad, focusing on Artificial Intelligence (AI), cloud computing, 5G/6G, semiconductor design, and digital public infrastructure, with an increasing role of private sector R&D.
- 4. Automotive, Electric Vehicles (EVs) & Advanced Manufacturing:** R&D is crucial for sustainable industrial transformation and energy transition, with the sector shifting towards electric mobility, battery technology, and sustainable engineering, focusing on EV ecosystems (battery storage, charging infrastructure) and Industry 4.0 technologies such as automation, robotics, and additive manufacturing, supported by government incentives and industry-led innovation.
- 5. Agriculture & Allied Sectors:** R&D is vital for ensuring food security and climate resilience, focusing on crop improvement, climate-resilient seeds, and precision agriculture, further strengthened by the RDI Scheme with a ₹1 lakh crore corpus, implemented by the Department of Science and Technology under the Anusandhan National Research Foundation (ANRF) to boost private participation and innovation.

Key challenges

- 1. Low Investment:** India's GERD remains **0.6–0.7% of GDP**, limiting scale and depth of research. For instance, Limited funding slows progress in **semiconductor fabrication and deep-tech R&D**.
- 2. Weak Private Sector Participation:** Private sector contributes only **35–36%**, unlike >70% in developed countries. Industry hesitates due to **high risk and long gestation periods**. For instance, only few Indian firms invest heavily in **frontier tech like AI chips or drug discovery**.

3. **Structural Issues:** R&D ecosystem is **government-dominated**, reducing flexibility and risk-taking. For instance, Innovation hubs remain concentrated in **Bengaluru, Hyderabad**, not widely distributed.
4. **Innovation, Talent & Infrastructure Constraints:** India's R&D ecosystem is constrained by a **focus on incremental innovation** and weak industry-academia linkages, limiting commercialization. It also faces a **shortage of high-end interdisciplinary talent**. Further, **uneven research infrastructure**, especially in Tier-2/3 institutions, restricts innovation diffusion.
5. **Regulatory & Financial Bottlenecks:** **Bureaucratic delays and complex regulations** slow research approvals. Limited access to **risk capital and venture funding for deep-tech**.

India's initiatives Related to R&D

- **Vigyan Dhara Scheme:** Umbrella scheme by the Department of Science and Technology to strengthen research, innovation, and S&T capacity building.
- **Rashtriya Vigyan Puraskar (RVP):** National awards to **recognise excellence in science, technology, and innovation**.
- **Science, Technology and Innovation Policy (STIP) 2020:** Policy framework to **boost R&D investment, promote open science, and enhance private sector participation**.
- **VAIBHAV Fellowship:** Initiative to **connect Indian diaspora scientists with domestic institutions** for collaborative research.

Way forward

1. **Enhance Investment & Leverage Institutional Mechanisms:** Increase R&D spending with greater **private sector participation**, effectively utilise Anusandhan National Research Foundation (ANRF), and ensure timely deployment of the **₹1 lakh crore RDI fund (Budget 2025-26)** to boost deep-tech innovation.
2. **Strengthen University-Industry Linkages:** Promote a **university-led research model**, where Higher Education Institutions drive upstream research and collaborate with industry for **commercialisation of technologies**.
3. **Improve Governance & Encourage Risk-taking:** Adopt efficient project management on lines of Defense Advanced Research Projects Agency (DARPA), with transparent funding and flexibility, while enabling **risk-taking in early-stage research** for breakthrough innovations.

Conclusion

India's R&D ecosystem has **strong institutional foundations but weak funding and structural gaps**. Enhancing **private participation, innovation culture, and policy support** is crucial for achieving the goal of a **knowledge-driven "Viksit Bharat" by 2047**.

KEY WORDS

- **Anusandhan National Research Foundation (ANRF)**- Apex body to fund, coordinate, and promote research and innovation with a focus on private sector participation.
- **Global Capability Centres (GCCs)**: Offshore innovation hubs of multinational companies in India driving R&D in areas like AI, cloud computing, and semiconductors.
- **Biotechnology Industry Research Assistance Council (BIRAC)**: Government-backed organization that supports biotech startups and translational research through funding and incubation.
- **GERD (Gross Expenditure on R&D)**: Total national spending on research and development as a percentage of GDP, indicating a country's innovation investment level.

UPSC PYQ

- Scientific research in Indian universities is declining because a career in science is not as attractive as it was earlier. Comment. **[2014]**
- How is science interwoven deeply with our lives? What are the striking changes in agriculture triggered off by the science-based technologies? **[2020]**

9) HEATWAVES

GS-III: Disaster Management (heatwaves), Environment & Climate Change (rising temperatures, extreme events), and S&T applications (IMD forecasting, Heat Early Warning Systems).

Introduction

Heatwave refers to the period of abnormally high temperatures, more than the normal maximum temperature, that occurs during the summer season. They are termed a “**silent disaster**” due to their gradual onset and high mortality impact. In India, they typically occur between **March–June**, with temperatures exceeding **40°C in plains**. Climate change is intensifying heatwaves; they are projected to **last up to 25 times longer (2036–65)** under high emissions, despite increasing severity, heatwaves are **not included as a notified disaster under the Disaster Management Act, 2005**.

Heat Wave Prone Areas of India

The Core Heatwave Zone (CHZ), which stretches throughout central, northern, and peninsular India from Gujarat to West Bengal, experiences heat waves every year from March to June, and infrequently in July.

India's Preparedness for Heat Waves

1. **Institutional Coordination Mechanism**- Multiple agencies work in convergence to address heatwave impacts, recognising that rising frequency and intensity of heatwaves severely affect public health, agriculture, livelihoods, food production, and disease patterns.
2. **Role of India Meteorological Department (IMD)**- The **India Meteorological Department** provides real-time weather data, forecasts maximum temperatures, and issues advance heatwave warnings to enable timely preparedness and response.
3. **Heatwave Early Warning Systems (HEWS)**- HEWS is designed to minimise human health impacts by ensuring **timely dissemination of heat alerts**, helping authorities and communities take preventive action.
4. **NDMA Initiatives**- The **National Disaster Management Authority** has undertaken capacity-building measures such as national workshops on “Preparedness, Mitigation & Management of Heat Wave” and webinars to strengthen institutional response.
5. **Health Surveillance & Research Mechanisms**- The **National Centre for Disease Control**, through the **Integrated Disease Surveillance Programme (IDSP)** under the Ministry of Health & Family Welfare, collects heatwave-related illness and mortality data, while the National Knowledge Network Programme on Climate Change and Human Health conducts studies on heat stress impacts, particularly occupational health risks.

Challenges

1. **Non-recognition as Notified Disaster**- Heatwaves are **not in the list of notified disasters**, limiting access to **NDRF funds** for instance, States depend mainly on **SDRF**, restricting large-scale response.
2. **Attribution & Data Issues**- Difficulty in identifying **heat-related deaths** (often linked to comorbidities), Leads to **underreporting and compensation challenges**, official data show wide discrepancies (NCRB: ~20,615; NDMA: ~17,767; IMD: ~10,545), reflecting weak reporting systems.
3. **Rapid urbanization** – It has created **heat traps** due to concrete surfaces, reduced vegetation, and high energy use. Urban areas can experience **2–4°C higher temperatures** than surrounding rural regions
4. **Institutional Gaps**- Although **Heat Action Plans (HAPs)** exist, their **implementation remains uneven and often symbolic**. Lack of coordination between **health, urban, and disaster management agencies** weakens effectiveness.

5. **Lack of Climate-resilient Infrastructure**- Poor housing, absence of ventilation, and heat-trapping materials increase exposure, especially in slums.

Way Forward

1. Strengthening Heat Action Plans (HAPs)- Heat Action Plans are the primary **short-term responsive strategy**, with the first model being the **Ahmedabad Heat Action Plan**. Currently, **17 heatwave-prone states** have adopted HAPs, which include early warning systems, inter-agency coordination, capacity building, awareness campaigns and more.
2. Cool Roof Deployment- Promoting **cool roofs** using reflective materials (solar reflective paint, mosaic tiles) increases surface albedo, reducing indoor temperatures and cooling demand. This low-cost intervention also reduces energy consumption and air pollution, and has been successfully adopted in cities like **Ahmedabad** and **Hyderabad**.
3. Urban Forestation & Heat Island Reduction- Urban afforestation using techniques like the **Miyawaki method** enhances green cover, increases albedo, and mitigates the **urban heat island effect**, thereby lowering city temperatures.
4. Forest Conservation & Restoration- Protecting and restoring forests is critical as they act as **carbon sinks**, helping reduce emissions and moderating long-term heatwave intensity.
5. Promotion of Regenerative Agriculture- Shifting from conventional agriculture to **regenerative practices** (crop diversity, reduced chemical inputs) improves soil health, enhances climate resilience, regulates microclimate, and reduces vulnerability to extreme heat.

Conclusion

Heatwaves are no longer episodic weather events but a **systemic climate risk** demanding urgent policy attention. A shift from fragmented responses to **integrated, data-driven, and people-centric strategies**, combining immediate preparedness with long-term mitigation, is essential to build a **heat-resilient India**.

KEY WORDS

- **NCRB (National Crime Records Bureau)**: India's central agency that Compiles accidental death data (including deaths due to heat/sunstroke) based on police records often higher due to broader classification.
- **NDMA (National Disaster Management Authority)**: Apex body chaired by the Prime Minister that formulates policies, plans, and guidelines for disaster management in India.
- **SDRF (State Disaster Response Force)**: State-level specialized force trained for immediate disaster response and rescue operations.
- **NDRF (National Disaster Response Force)**: Specialized central force constituted for disaster response, working under NDMA for handling major emergencies.
- **NDRF/SDRF Funds**: Dedicated financial mechanisms under the Disaster Management Act for funding relief, response, and rehabilitation during disasters at national and state levels.
- **Miyawaki Method**: A Japanese afforestation technique that enables rapid growth of dense, native forests in small urban spaces.

UPSC PYQ

- *"Mumbai, Delhi and Kolkata are the three mega cities of the country but the air pollution is much more serious problem in Delhi as compared to the other two. Why is this so?". [2015]*

10) ENERGY DIVERSIFICATION

(GS-III Infrastructure: Energy, Ports, Roads, Airports, Railways etc.)

Background

The ongoing **West Asia crisis** marked by geopolitical volatility in the Strait of Hormuz and the Red Sea has exposed the fragility of global energy supply chains. For India, which imports over **85% of its crude oil**, these disruptions pose a direct threat to energy security and economic stability. To mitigate such external shocks, India must aggressively pursue **energy diversification**, shifting from a heavy reliance on specific geographies and fossil fuels toward a multi-faceted, resilient energy basket.

Significance of Energy Diversification

1. **Geopolitical resilience** is strengthened when India **reduces its over-dependence** on the volatile Middle East, thereby **minimizing the risk of “energy blackmail” and supply disruptions** arising from regional conflicts or maritime blockades.
2. **Economic stability** is enhanced through diversification of energy sources, as it **helps stabilize the Current Account Deficit (CAD)** by enabling India to negotiate better prices and hedge against sudden global oil price fluctuations.
3. Environmental commitments are supported by **integrating renewable energy sources** such as solar and wind, which is essential for **achieving the COP26 Panchamrit targets**, including the goal of attaining net zero emissions by 2070.
4. **Energy access and equity** are improved through a diversified energy mix that includes decentralized biomass and small-scale hydropower, ensuring reliable and affordable electricity reaches rural and marginalized last-mile communities.
5. **Technological innovation** is promoted by transitioning to **emerging fuels like green hydrogen**, which encourages the development of a domestic manufacturing ecosystem and positions India as a global hub for clean energy technologies.

Challenges

1. The transition involves **high upfront costs**, as significant investment is required for infrastructure such as smart grids, storage systems, and renewable capacity expansion, **making financing difficult due to the high cost of capital**.
2. **Renewable energy sources** like solar and wind face intermittency issues, as **they are dependent on weather conditions**; without advanced Battery Energy Storage Systems (BESS), ensuring a stable base load for the grid remains challenging.
3. The shift toward electric mobility and clean technologies introduces **a new dependency on critical minerals** such as lithium, cobalt, and rare earth elements, often sourced from countries like China.
4. Infrastructural bottlenecks persist due to **aging thermal-based systems**, while transitioning to gas-based systems or hydrogen blending requires major technical upgrades and regulatory changes.
5. **Policy and regulatory uncertainties**, including inconsistent state-level policies on land acquisition and Power Purchase Agreements (PPAs), continue to deter long-term private investment in the renewable energy sector.

Way Forward

1. **Strategic Petroleum Reserves (SPR):**
India must accelerate **Phase II of its Strategic Petroleum Reserves** to enhance its emergency oil buffer capacity. Expanding storage facilities at additional locations will help cushion short-term disruptions caused by geopolitical tensions in West Asia, ensuring energy availability and price stability during crises.

2. Strengthening International Alliances:

Deepening engagement through platforms like the **International Solar Alliance and the Global Biofuels Alliance** can facilitate access to diversified energy sources, critical technologies, and climate finance. Such collaborations also strengthen India's leadership role in global energy governance.

3. Incentivizing Domestic Production:

Expanding the Production Linked Incentive (PLI) scheme to cover high-efficiency solar modules and green hydrogen electrolyzers will boost domestic manufacturing capacity. This reduces dependence on imports, strengthens supply chains, and aligns with the goal of Atmanirbhar Bharat in the clean energy sector.

4. Grid Modernization:

Investments in Green Energy Corridors and AI-enabled smart grids are essential for integrating variable renewable energy like solar and wind into the national grid. Modern grids improve efficiency, reduce transmission losses, and ensure stable, reliable power supply even with fluctuating generation patterns.

5. Circular Economy in Energy:

Promoting recycling and reuse of solar panels, lithium-ion batteries, and other energy components can significantly reduce dependence on imported critical minerals. It also minimizes environmental degradation, supports sustainable resource use, and creates new green industries and jobs within the economy.

Conclusion

Energy diversification is no longer just an environmental choice but a **strategic imperative** for India's sovereignty. By balancing traditional energy ties with a bold pivot toward renewables and alternative fuels, India can transform its vulnerability into a "Viksit Bharat" strength. Navigating the current West Asian turbulence requires a visionary approach that ensures energy remains a bridge to prosperity, not a barrier to growth.

KEY WORDS

- **Strait of Hormuz**- Critical oil transit chokepoint connecting the Persian Gulf to global markets.
- **Red Sea Route**- Key maritime route for global trade and energy shipments passing near conflict-prone regions.
- **Current Account Deficit (CAD)**- Economic imbalance caused when imports (including oil) exceed exports.
- **COP26 Panchamrit Targets**- India's climate commitments including net zero by 2070 and renewable expansion.

MODEL QUESTIONS

- 1) The long-standing debate on Section 377 of the Indian Penal Code has finally been settled by the Supreme Court. In this context, discuss the conflict between 'Social Morality' and 'Constitutional Morality'
- 2) "Sea-level rise in the North Indian Ocean is no longer a distant threat but a driver of recurring urban crises." Discuss the impacts of rising sea levels on Indian coastal cities with suitable examples. (250 words)
- 3) Centralised control over Central Armed Police Forces (CAPFs) is essential for national security, but it may undermine institutional capacity-building. Comment in light of the recent CAPF Bill 2026.
- 4) "Discuss the need for a comprehensive legislative framework on passive euthanasia in India. Examine the challenges in its implementation."
- 5) The independence of the Election Commission of India is crucial for ensuring free and fair elections in a democracy. In the light of recent concerns regarding its appointment process, financial autonomy, and enforcement powers, critically examine the constitutional safeguards available to the Election Commission of India. Suggest reforms to strengthen its independence.
- 6) Critically analyse the tension between the right to self-defense under the UN Charter and the prohibition on the use of force in international relations. (250 words)
- 7) What is meant by judicial overreach? Discuss its impact on the separation of powers in India.
- 8) India's goal of becoming a knowledge-driven economy requires a strong R&D ecosystem. Examine the key challenges in India's R&D sector. Suggest measures to enhance innovation and private sector participation."
- 9) Urbanization and climate change have amplified heatwave risks in India." Analyse their role and evaluate the effectiveness of Heat Action Plans (HAPs).
- 10) India's dependence on imported crude oil makes it vulnerable to global geopolitical shocks. In this context, explain the importance of energy diversification for India.